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ENGINEERING REPORT

I. Introduction

1. On behalf of NY3G Partnership ("NY3G"), the MMDS licensee of WMY467, New York, NY (operating on the F-Group Channels), this Engineering Report assesses the technical limitations placed on NY3G and TVC, the grandfathered ITFS licensee, in offering commercial two-way broadband service to Greater New York City, under the FCC's split-the-football approach in determining service areas available to each entity[1].

II. Projected GSA Split will Preclude Service to a Substantial Number of New York City Residents, Including Those in Manhattan, Brooklyn and Queens

2. TVC has two main grandfathered ITFS F-channel stations in the New York City Area (KNZ70 and KVS31). NY3G has one main MMDS F-channel station (WMY467). In its Further Notice of Proposed Rulemaking ("FNPRM"), the Commission is considering adopting a rule that determines the Geographic Service Areas ("GSAs") of co-channel licensees by "splitting-the-football" between the Protected

[1] MMDS and ITFS are now designated as BRS and EBS based on the new Part 27 Rules that govern the licensed 2.5 to 2.7 GHz Service. *See In the Matter of Amendment of Parts 1, 21, 73, 74 and 101 of the Commission's Rules to Facilitate the Provision of Fixed and Mobile Broadband Access, Educational and Other Advanced Services in the 2150-2162 and 2500-2690 MHz Bands*, Report and Order and Further Notice of Proposed Rulemaking, FCC 04-135 (2004). Both the old and new designations will be used as appropriate for the discussion.

Service Areas ("PSAs") of co-channel stations.[2] Assuming that the stations have PSAs and are entitled to GSAs, their service areas will be limited by the considerable PSA overlap. Using the methodology of the new wireless broadband rules for determining GSAs, Figure 1, which is attached, shows the projected GSA for WMY467 and TVC's stations, under such circumstances.

3. As demonstrated by Figure 1, the border between the GSAs of NY3G and TVC occurs just to the east of Manhattan, approximately 2.5 kilometers from the Empire State Building ("ESB"). (To simplify the discussion, the GSAs for the two TVC stations, KNZ70 and KVS31, are combined into a single GSA. The combined TVC GSA border is coterminous with the outer boundaries of the separately-defined KNZ70 and KVS31 GSAs.) The year 2000 population within the NY3G GSA (as shown in Figure 1) is 8,098 K persons and that of the TVC GSA is 8,240 K persons[3].

4. Section 27.55(a)(4)(i) of the new FCC Rules governs the allowed signal strength at one's GSA border for operations within the lower and upper low-powered frequency band segments (the "LBS" and "UBS", respectively). For the LBS or UBS bands (and in the case of the F-Channels, the low-powered frequency spectrum is in the UBS), this rule section restricts a BRS or EBS station from operating with a signal strength level above 47 dBuV/m (for a 5.5 MHz frequency bandwidth) at its GSA border unless affected licensees agree to a different field strength. Assuming the use of an extremely low-powered maximum EIRP of 0.1 watts (-10 dBW) for a base station within Manhattan, a signal strength level of 47 dBuV/m is predicted to exist at a distance of up to 7.8 kilometers from the transmitter site[4]. In other words, even at this very low ERP, a

[2] The FCC assumes that all stations have 35-mile radius PSAs.
[3] All population data of this report are based on year 2000 Census Data.
[4] Based upon free space loss and assuming line-of-sight.

base station could not be located within 7.8 kilometers of the GSA border[5]. (Actual reliable service from a base station that operates with 0.1 watts EIRP in New York City is expected to be less than 2 kilometers.) Therefore, with the GSA split occurring near Manhattan as depicted in Figure 1, the 47 dBuV/m signal strength benchmark at the NY3G/TVC GSA border will effectively prevent any service to Manhattan.

5. Additionally, the 47 dBuV/m signal strength standard also applies to upstream transmissions from the customer premise equipment (CPE) of the two-way service. Any CPE unit that supports portability (and, more specifically, that will support mobility, such as the planned IEEE 802.16e "WiMAX" mobility standard that is currently being developed) will likely use an omnidirectional antenna with an EIRP above 0.1 watts. Similar to the base station, any such CPE operating at or above 0.1 watts EIRP would not be permitted to operate within 7.8 kilometers of the GSA border[6].

6. Assuming that NY3G and TVC are not permitted to operate a base station or to have a CPE customer located within 7.8 kilometers of the common NY3G/TVC GSA border, Figure 2, attached, demonstrates the actual service area that is effectively available to both NY3G and TVC within each entity's respective GSA. As shown in Figure 2, the 7.8 kilometer wide exclusion zone[7] for NY3G (the area where service cannot be provided) contains all of Manhattan, and the exclusion zone for TVC includes

[5] Affected licensees could agree to operate under different field strengths.
[6] This assumes that the CPE customer unit (which, as a portable device, may operate from a relatively high building site) has a line-of-site signal at the GSA border or into the neighboring GSA. Because the entire GSA border must be protected, it is assumed that any portable or mobile CPE within 7.8 kilometers of the border will potentially have line-of-site to the GSA border, or into the neighboring GSA. This is also true of any base station that will transmit from a high building rooftop within Manhattan and the wider New York City Area.
[7] The exclusion zone would also exist near the GSA border that is coterminus with the PSA border; however, since no co-channel operators exists in these neighboring areas to the south west and north of Manhattan, the new rules permit signal strength values above the 47 dBu benchmark at the GSA/PSA coterminus border.

large portions of Brooklyn and Queens. The two exclusion zones will restrict the service available to NY3G and TVC as shown by the following table[8]:

Table 1

GSA(s)	GSA Pop.	Exclusion Zone Pop.	Exclusion Zone % of GSA Pop.
NY3G (limited by both KNZ70 & KVS31 PSAs)	8,098 K	4,056 K	50.1
TVC (for combined KNZ70 & KVS31 GSAs)	8,240 K	3,273 K	39.7
Combined NY3G & TVC	16,338 K	7,329 K	44.9

7. It is important to note that the 7.8 kilometer exclusion zone distance (discussed above) is only an example of the restrictions imposed by the 47 dBuV/m standard when a maximum EIRP of 0.1 watts is used (for both the base station and the CPE). The 0.1 watt EIRP is a very low radiated power level, and will have a limited service range of only one to two kilometers from the base station. The 0.1 watt EIRP used in the above example is much less than the EIRP of the various vendor equipment available in the MMDS and ITFS. (For example, IPWireless has a typical base station EIRP that is above 40 watts, or more than 400 times higher than the 0.1 watts EIRP used in the above example.) Therefore, in actuality, the exclusion zones that are depicted in Figure 2 will typically be

[8] The same GSA designations for NY3G and TVC within the high-powered middle band segment (MBS) will limit the high-powered use in the same way, although with higher EIRP limitations. The power flux density standard at the GSA border would prevent either entity from operating an omnidirectional base station within the 7.8 kilometer exclusion zones of more than 38 watts EIRP.

much wider (based upon the need to deploy with a higher EIRP system), and will eliminate service to many more persons near the GSA border[9].

III. A GSA Split Considering Only One TVC F-Group Station Will Not Resolve the Exclusion Zone Problem, and Will Still Prevent Service to Substantial Areas of New York City

8. An alternative option that allows only one of the two TVC F-Group stations (either KNZ70 or KVS31) to have a PSA, and a corresponding GSA, slightly improves the situation. Figures 3A and 3B, attached, shows the NY3G and TVC GSA border and 7.8 kilometer exclusion zones assuming that PSA overlap with WMY467 exists from either KNZ70 (Figure 3A) or KVS31 (Figure 3B). For the WMY467 GSA as defined by a split with the KNZ70 PSA only, the 7.8 kilometer exclusion zone would continue to include most of Manhattan (see Figure 3A). For the WMY467 GSA as defined by a split with the KVS31 PSA only, the 7.8 kilometer

[9] While higher-powered directional base stations could be deployed such that pattern nulls are placed towards the GSA, the nulls would still likely have EIRP values in excess of 0.1 watts. Therefore, the 7.8 kilometer (or greater) exclusion zones of Figure 2 would still exist.

exclusion zone would include almost all of Manhattan (see Figure 3B). The exclusion zones for these two GSA options have the following characteristics:

Table 2

GSA(s)	GSA Pop.	Exclusion Zone Pop.	Exclusion Zone % of GSA Pop.
NY3G (limited by KNZ70 Only - Figure 3A)	11,321 K	4,960 K	43.8
TVC with KNZ70 Only (Figure 3A)	4,988 K	1,906 K	38.2
Combined NY3G & TVC (WMY467 & KNZ70 only)	16,309 K	6,866 K	42.1
NY3G (limited by KVS31 Only - Figure 3B)	8,703 K	4,145 K	47.6
TVC with KVS31 Only (Figure 3B)	7,277 K	3,110 K	42.7
Combined NY3G & TVC (WMY467 & KVS31 only)	15,980 K	7,255 K	45.4

9. As demonstrated above, the scenario that considers only one TVC F-Group station PSA is slightly better than when both TVC PSAs are considered. However, both TVC single-station alternatives still exclude a significant number of area residents from receiving service. As demonstrated by Figures 2, 3A and 3B, and Tables 1 and 2, it is clear that the "split-the-football" methodology used in this instance (for either two TVC stations or for one TVC station) will leave a large portion of the New York City Area unserved.

V. Conclusion

10. The Commission's proposal to split-the-football to resolve co-channel conflicts would result in substantially reduced service areas, where licensees have significant overlap in their presumed PSAs, due to the 47 dBuV/m signal strength benchmark at the GSA border. In the New York City market, because the GSA split occurs near Manhattan and the population center of the NYC market, the "split-the-football" approach would exclude service to approximately 7.329 million residents in the New York City market. As demonstrated above, even assuming a very low operating EIRP of 0.1 watts, exclusion zones will exist within the NY3G and TVC GSAs that will prevent service by NY3G to all of Manhattan, and that will prevent service by TVC to large portions of Brooklyn and Queens. This scenario will still exist if only one TVC F-Group station is considered.

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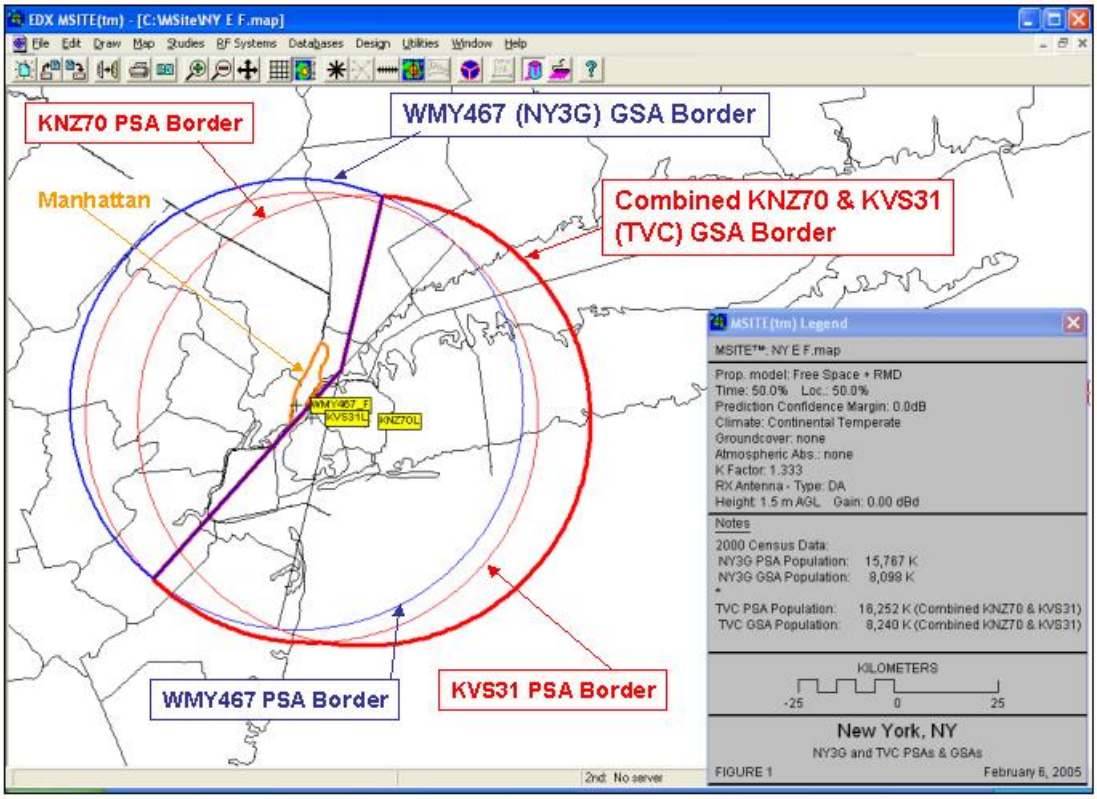
DeLawder Communications, Inc.

Date: February 7, 2005

Figure 1.


EDX MSITE(tm) - [C:\MSite\NY E F.map]
File Edit Draw Map Studies RF Systems Databases Design Utilities Window Help
KNZ70 PSA Border
WMY467 (NY3G) GSA Border
Manhattan
Combined KNZ70 & KVS31 (TVC) GSA Border
WMY467_F
KVS31L
KNZ70L
WMY467 PSA Border
KVS31 PSA Border
MSITE(tm) Legend
MSITE™: NY E F.map
Prop. model: Free Space + RMD
Time: 50.0% Loc.: 50.0%
Prediction Confidence Margin: 0.0dB
Climate: Continental Temperate
Groundcover: none
Atmospheric Abs.: none
K Factor: 1.333
RX Antenna - Type: DA
Height: 1.5 m AGL Gain: 0.00 dBd
Notes
2000 Census Data:
NY3G PSA Population: 15,767 K
NY3G GSA Population: 8,099 K
TVC PSA Population: 16,252 K (Combined KNZ70 & KVS31)
TVC GSA Population: 8,240 K (Combined KNZ70 & KVS31)
KILOMETERS
-25
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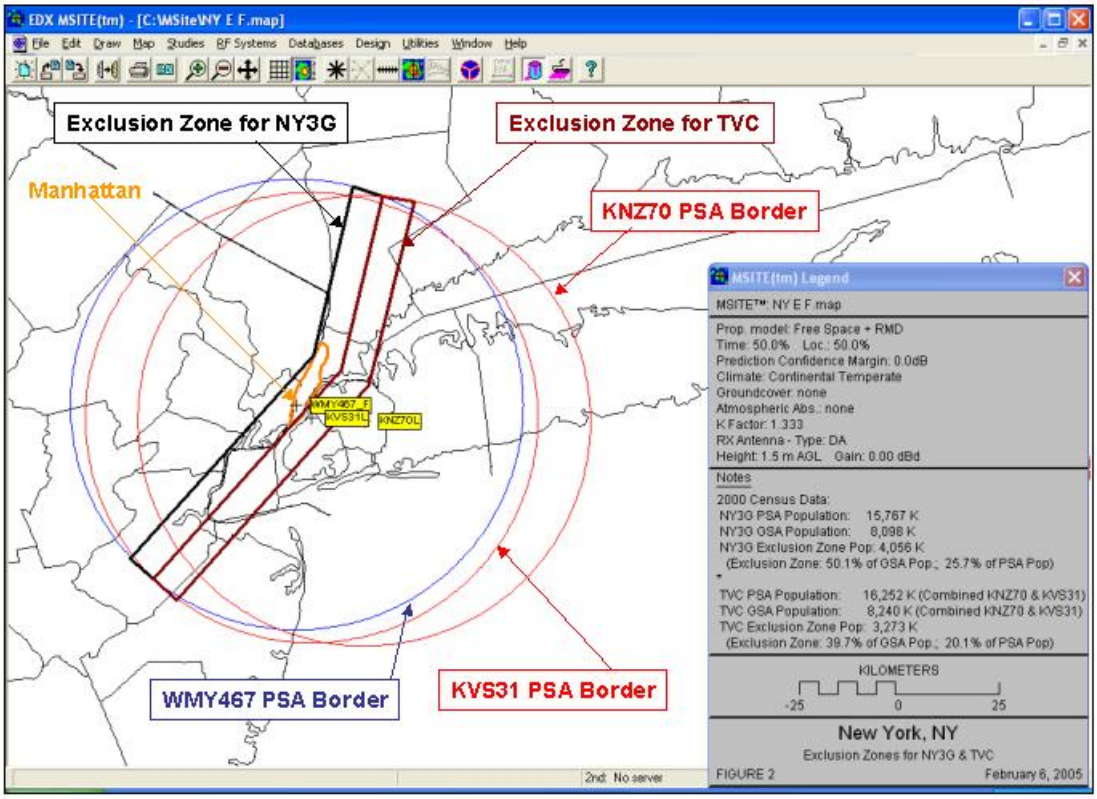
25
New York, NY
NY3G and TVC PSAs & GSAs
FIGURE 1
February 6, 2005
2nd: No server

Figure 2.


EDX MSITE(tm) - [C:\MSite\NY E F.map]
File Edit Draw Map Studies RF Systems Databases Design Utilities Window Help
Exclusion Zone for NY3G
Exclusion Zone for TVC
Manhattan
KNZ70 PSA Border
WMY467_F
KVS31L
KNZ70L
WMY467 PSA Border
KVS31 PSA Border
2nd: No server
MSITE(tm) Legend
MSITE™: NY E F.map
Prop. model: Free Space + RMD
Time: 50.0% Loc.: 50.0%
Prediction Confidence Margin: 0.0dB
Climate: Continental Temperate
Groundcover: none
Atmospheric Abs.: none
K Factor: 1.333
RX Antenna - Type: DA
Height: 1.5 m AGL Gain: 0.00 dBd
Notes
2000 Census Data:
NY3G PSA Population: 15,767 K
NY3G GSA Population: 8,098 K
NY3G Exclusion Zone Pop: 4,056 K
(Exclusion Zone: 50.1% of GSA Pop.; 25.7% of PSA Pop)
TVC PSA Population: 16,252 K (Combined KNZ70 & KVS31)
TVC GSA Population: 8,240 K (Combined KNZ70 & KVS31)
TVC Exclusion Zone Pop: 3,273 K
(Exclusion Zone: 39.7% of GSA Pop.; 20.1% of PSA Pop)
KILOMETERS
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New York, NY
Exclusion Zones for NY3G & TVC
FIGURE 2
February 6, 2005

Figure 3A.

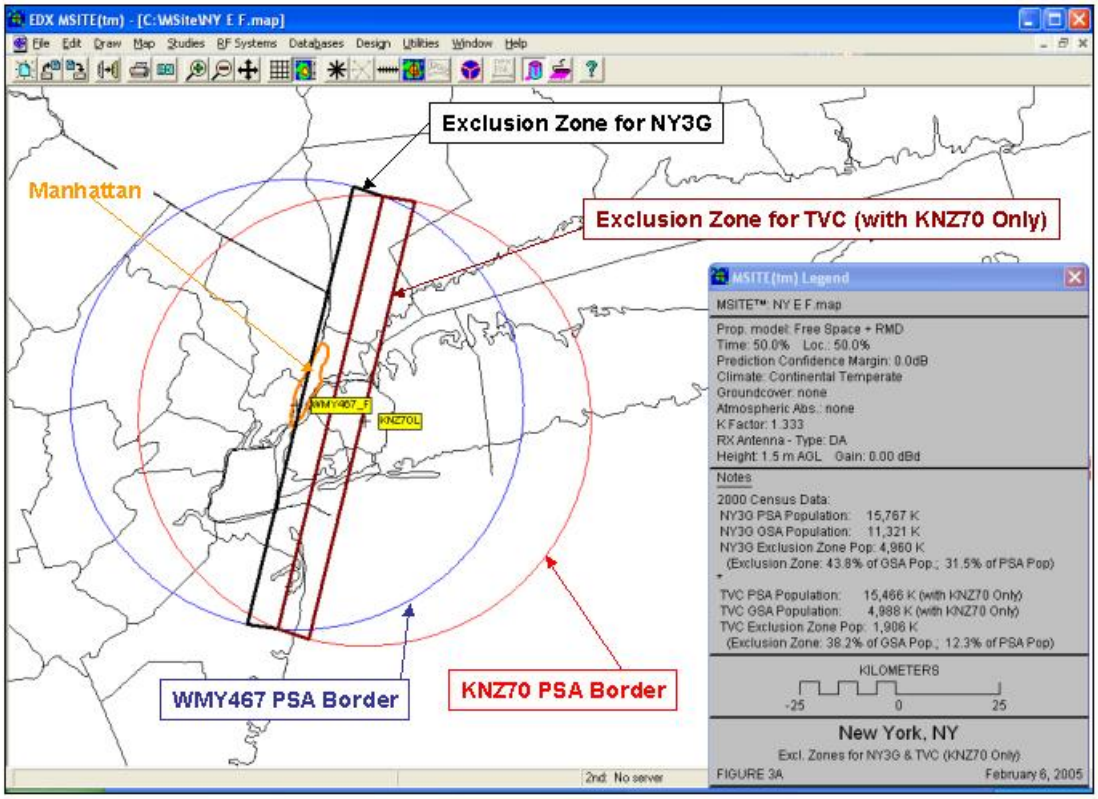
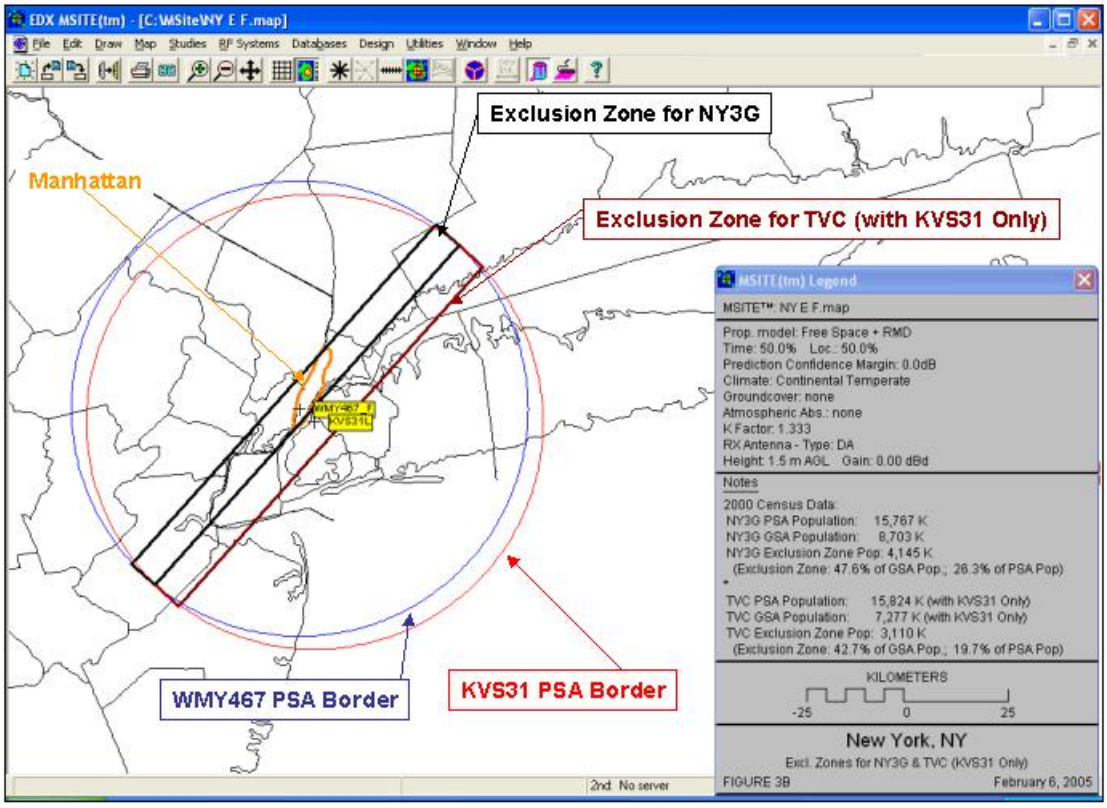

EDX MSITE(tm) - [C:\MSite\NY E F.map]
File Edit Draw Map Studies RF Systems Databases Design Utilities Window Help
Exclusion Zone for NY3G
Manhattan
Exclusion Zone for TVC (with KNZ70 Only)
WMY467_F
KNZ70L
WMY467 PSA Border
KNZ70 PSA Border
MSITE(tm) Legend
MSITE™: NY E F.map
Prop. model: Free Space + RMD
Time: 50.0% Loc.: 50.0%
Prediction Confidence Margin: 0.0dB
Climate: Continental Temperate
Groundcover: none
Atmospheric Abs.: none
K Factor: 1.333
RX Antenna - Type: DA
Height: 1.5 m AGL Gain: 0.00 dBd
Notes
2000 Census Data:
NY3G PSA Population: 15,767 K
NY3G GSA Population: 11,321 K
NY3G Exclusion Zone Pop: 4,960 K
(Exclusion Zone: 43.8% of GSA Pop.; 31.5% of PSA Pop)
TVC PSA Population: 15,466 K (with KNZ70 Only)
TVC GSA Population: 4,988 K (with KNZ70 Only)
TVC Exclusion Zone Pop: 1,906 K
(Exclusion Zone: 38.2% of GSA Pop.; 12.3% of PSA Pop)
KILOMETERS
-25
0
25
New York, NY
Excl. Zones for NY3G & TVC (KNZ70 Only)
FIGURE 3A
February 6, 2005
2nd: No server

Figure 3B.


EDX MSITE(tm) - [C:\MSite\NY E F.map]
File Edit Draw Map Studies RF Systems Databases Design Utilities Window Help
Exclusion Zone for NY3G
Manhattan
Exclusion Zone for TVC (with KVS31 Only)
MSITE(tm) Legend
MSITE™: NY E F.map
Prop. model: Free Space + RMD
Time: 50.0% Loc.: 50.0%
Prediction Confidence Margin: 0.0dB
Climate: Continental Temperate
Groundcover: none
Atmospheric Abs.: none
K Factor: 1.333
RX Antenna - Type: DA
Height: 1.5 m AGL Gain: 0.00 dBd
Notes
2000 Census Data:
NY3G PSA Population: 15,767 K
NY3G GSA Population: 8,703 K
NY3G Exclusion Zone Pop: 4,145 K
(Exclusion Zone: 47.6% of GSA Pop.; 26.3% of PSA Pop)
TVC PSA Population: 15,824 K (with KVS31 Only)
TVC GSA Population: 7,277 K (with KVS31 Only)
TVC Exclusion Zone Pop: 3,110 K
(Exclusion Zone: 42.7% of GSA Pop.; 19.7% of PSA Pop)
KILOMETERS
-25
0
25
New York, NY
Excl. Zones for NY3G & TVC (KVS31 Only)
FIGURE 3B
February 6, 2005
WMY467 PSA Border
KVS31 PSA Border
2nd No server